

**AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND
AIR CONDITIONING ENGINEERS, INC.**

1791 Tullie Circle, NE / Atlanta, GA 30329
(404) 636-8400

TC/TG/TRG MINUTES COVER SHEET

(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG NO.: 4.10

TC/TG/TRG TITLE: INDOOR ENVIRONMENTAL MODELING

DATE OF MEETING: January 29, 2001

LOCATION: Atlanta

DATE ISSUED: May 21, 2001

RECORDED BY: **W. S. Dols**

| VOTING MEMBERS | YEAR | | PRESENT y/n | Sub-committee Chairs | |
|-------------------------------|------|-----|-------------|----------------------|------------------|
| | On | Off | | | |
| Horstman, Raymond, Chair | 00 | 02 | Y | Membership | Hosni, Mohammad |
| Schwarz, Walter, Vice Chair | 00 | 02 | Y | Programs | Emmerich, Steven |
| Clark, Daniel | 00 | 02 | Y | Research | Phillips, Duncan |
| Emmerich, Steven | 98 | 02 | Y | Standards | Ensor, David |
| Kato, Shinsuke, International | 00 | 04 | N | Secretary/Web Page | Dols, W. Stuart |
| Baker, A J | 99 | 03 | N | Handbook | Baker, A. J. |
| Ensor, David | 98 | 02 | Y | | |
| Gaston, Charles | 00 | 02 | N | | |
| Hosni, Mohammad | 00 | 04 | Y | | |
| Musser, Amy | 01 | 05 | Y | | |
| Phillips, Duncan | 00 | 04 | Y | | |
| Van Gilder, James | 01 | 05 | Y | | |
| Von Kempster, Diotima | 98 | 02 | Y | | |
| Yang, Xudong | 01 | 05 | Y | | |
| | | | | | |

| CORRESPONDING MEMBERS | | PRESENT | | CORRESPONDING MEMBERS | | PRESENT | |
|-----------------------|--|---------|--|-----------------------|--|---------|--|
| Allard, Francis | | N | | | | | |
| Anderson, Ren | | N | | Markel, Lawrence | | N | |
| Arens, Edward | | N | | Melikov, Arsen | | Y | |
| Axley, James | | N | | Morrison, Ian | | N | |
| Baban, Farzad | | N | | Murakami, Shuzo | | Y | |
| Barakat, James | | N | | Musser, Amy | | N | |
| Barles, Pierre | | N | | Offermann, Francis | | N | |
| Becker, Bryan | | N | | Olesen, Bjarne | | N | |
| Blackmore, Byron | | N | | Pei, Hsien-Sheng | | N | |
| Carter, John | | Y | | Peterson, Janice | | N | |
| Chen, Qingyan | | N | | Phillips, Duncan | | N | |
| Christianson, Leslie | | N | | Rivers, Richard | | N | |
| Colliver, Donald | | N | | Roberts, Jack | | N | |
| Dols, W. Stuart | | N | | Rogers, Lisa | | N | |
| Fanger, Ole | | N | | Sanchez, Greg | | Y | |
| Farrington, Franklin | | N | | Sawachi, Takao | | N | |
| Gadgil, Ashok | | N | | Seppanen, Olli | | N | |
| Gordon, Elliott | | N | | Sestak, George | | N | |
| Grimsrud, David | | N | | Shaw, Chia-Yu | | N | |
| Grot, Richard | | N | | Sinclair, Ray | | N | |
| Haghighat, Fariborz | | N | | Srebric, Jelena | | Y | |
| Hall, John | | N | | Teichman, Kevin | | N | |
| Hensen, Jan | | Y | | Tompkins, Dean | | N | |
| Hosni, Mohammad | | N | | Tronville, Paolo | | Y | |
| Int-Hout, Daniel | | Y | | Vandermeullen, Paul | | N | |
| Janssen, John | | N | | Walton, George | | N | |
| Jones, Gordon | | N | | Willman, Alexander | | N | |
| Jones, Robert | | N | | Yoshizawa, Susumu | | | |
| Kato, Shinsuke | | N | | Zhang, Dexian | | N | |
| Kelso, Richard | | N | | Zhang, Jianshun | | Y | |
| Kerr, Carolyn | | Y | | Zhang, Wei | | N | |
| Kirkpatrick, Allan | | N | | | | N | |
| Knappmiller, Kevin | | N | | | | | |
| Krafthefer, Brian | | N | | | | | |
| Levin, Hal | | N | | | | | |
| Manning, Andy | | N | | | | | |
| Markel, Morris | | N | | | | | |

ADDITIONAL ATTENDANCE

| | |
|------------------|---------------------|
| Goa, Yang | MIT |
| Kondo, Yasushi | MIT |
| Jones, Byron | Kansas State |
| Yang, Xudong | University of Miami |
| Armstrong, Peter | PNNL |

Society Liaisons, etc.

Present:

| | | |
|------------------|--------------------------------|-----|
| Groll, Eckhard | TAC Section Head | y/n |
| Boome, Alexander | Education Liaison | N |
| Crowther, Hugh | Refrigeration Liaison | N |
| Knebel, David | Standards Liaison | N |
| Friberg, Emil | Program Liaison | N |
| Sachs, Harvey | Journal/Insights Liaison | N |
| Dean, William | TAC Chairman | N |
| Driscoll, Joseph | Special Publications Liaison | N |
| Ramspeck, Claire | Staff Liaison (Standards) | N |
| Knight, William | TEGA Liaison | N |
| Seaton, William | Staff Liaison (Research) | N |
| Weiland, Martin | Staff Liaison (Tech. Services) | N |

1. **Call to Order:** Acting Chairman Ray Horstman called the meeting to order at 2:20 p.m
2. **Welcome and introductions:** Ray Horstman.
3. Eight out of eleven voting members were present at the **roll call** and a quorum was established. Minutes from the last meeting held in Minneapolis were approved 8-0-0-11.
4. **Announcements:** Ray Horstman attended the TC Chair and Research Committee Chair breakfast meeting and reported the following items:
 - Cutting back research => new projects must be very well justified and practical
 - Publications to 12 figure limit
 - E-publishing website in the works, but copyright issues
 - Journal – keeping articles more practical => technical articles for Research Journal
 - Technical Bulletin – looking for short articles
 - Standards – David Knebel new liaison
 - Looking for nominations for outstanding services to ASHRAE
 - Problems with handbook-inadequate data
 - New Energy Guidelines TP4.7
 - Standards not same as handbook-meet to review for conflicts
 - Membership database switchover April 1-Rollover roster
 - Good comments on website
 - New task groups; Total Building Commissioning, Maintenance and Contracting, Diagnostic Leading Edge Integrated Practice
 - Committee Feedback Form
 - Approved last meeting
5. **Membership:** Mohammad Hosni
 - Roster-update 12/2000 version
 - Farzad will be corresponding member, Jim Baker floating member
 - J. Greg Sanchez-corresponding member
6. **Research:** Chair Duncan Phillips led the discussion:
 - 12% reduction in money-\$3.3 million down to \$2.9 million.
 - RAC approved 14 work statements last meeting, 9 work statements put out to tender
 - 2 work statements recently approved-total 7 work statements approved, but will not be put out until May
 - Large amount of work statements ready to go, causing a 9 month to 1 year delay in approval of work statements and getting actual bids on them
 - More competitive - 90 TCs, each with a work statement-20 funded per year
 - Link to other TCs helps along with a strong work statements
 - High risk money for projects may disappear
 - No. of ASHRAE members are complaining that research is too fundamental and not applied enough
 - Local chapter presentations
 - Next review of work statements will be May

- **RP-903 Experimental Validation of Multizone Models for Predicting Air Contaminant Transport in High Rise Buildings** (PMS Chair: Dave Ensor, PI: Gren Yuill)
Recommend approval w/o modifications VOTE 7/0/1/11 Walt Schwarz abstained
- **RP-978 Interaction of Room Air Motion and the Human Body in Confined Spaces** (PMS Chair Jianshun Zhang, PI Byron Jones) –.
- **RP-1009 Simplified Diffuser Boundary Conditions for CFD Room Air Models** (PMS Chair Kevin Knappmiller, PI Yan Chen) – The experiments are done, the PMS is pleased, and a draft report is expected by the end of July 2000.
- **RP-1097 Modeling VOC Sorption of Building Materials and its Impact on Indoor Air Quality – Phase I** (PMS Chair: Dan Int-Hout, PI: Jianshun Zhang) – The PI for this project recently moved from the NRC in Ottawa to a position at Syracuse University. This meant that the PI lost access to an established experimental facility and would experience a delay in getting the experiments started at the new location. The committee voted 6-0-2-12 to recommend a 6-month no-cost extension for this project.
- **RP-1133 How to Verify, Validate, and Report Indoor Environmental Modeling CFD Analyses** (PMS Chair Farzad Baban, PI Yan Chen) – This project started two months ago and the PI will be able to devote a large amount of effort on this project for the remainder of the year and anticipates having a draft report available at the next meeting. A Sunday time slot at the next meeting will be reserved for discussion of progress on this project.
- **Research Plan** - should consist of 5-10 topics which we are interested in with the top 3-5 being prioritized. The top 3 need to have RTARs. The committee voted 8-0-0-12 for the following research plan:
 1. **Computational prediction and analysis of natural ventilation through large openings**
TC4.03: needs more work, will comment by 6/01 meeting
 2. **Modeling ventilated environments with transitional Reynolds numbers**
Was w/ #6 should be recombined w/ #6 again
 3. **Modeling ventilated environments with large heat loads** (Duncan Phillips)
 4. **Quantifying the macro effects of movement for indoor environmental modeling**
 5. ~~Modeling emissions from building material systems~~
 6. ~~Modeling low velocity large scale fluctuations~~
 7. ~~Instantaneous measurements~~

Need meeting times for 1097 (3:00?) and 1133 (11:15?) at Cincinnati meeting.

- Status of topics with highest priority:
 - **Computational Prediction and Analysis of Natural Ventilation Through Large Openings**
 - Voted and approved to be submitted at the Dallas meeting.
 - Wanted co-sponsorship from TC 4.3.
 - TC 4.3 had concerns and the concerns are addressed in an amended work statement.
 - TC 4.3 is deciding today whether or not to co-sponsor.
 - TC 4.10 voted 8-0-0-12 to submit work statement as amended.
 - **Modeling Ventilated Environments with Transitional Reynolds Numbers** - A draft was prepared by Ray Horstman and discussed at the meeting. Committee members may expect a revised copy and possibly be asked to vote on it by email.
 - **Modeling Ventilated Environments with Large Heat Loads** – A draft work statement exists and Duncan Phillips will contact Kevin McGrattan for his comments also ask the committee members to review it also with a possible vote by email.

7. **Program** – reported by Steve Emmerich

- Two symposia scheduled simultaneously.
MOVE to register a formal complaint with Program Committee VOTE 8/0/0/11
- On-line submittals?
- Packages for the Cincinnati meeting are due February 9th and expected programs from TC 4.10 are:
 - Symposium - **Experimental Validation of Multizone IAQ Models** organized by Amy Musser
 - Symposium - **Modeling and Measurement of VOC Emissions from Building Materials** organized by Gemma Kerr
 - Seminar - **Computer models of Large Occupied Indoor Spaces** organized by Duncan Phillips
- Expected program for Atlantic City:
 - Symposium - **Application of Indoor Environmental Modeling to Real World Building Airflow Design Problems** organized by Steve Emmerich
 - Symposium - **Experimental and Numerical Studies of Airflow in Inside Transportation Environments** organized by Walter Schwarz
 - Symposium - **Modeling Natural or Hybrid Ventilation Systems** organized by Jim Van Gilder
 - Seminar – **Advances in CFD Modeling**.
- Suggestions for Honolulu June 2002: Submitted by Sept 28, 2001. Deadline Feb 28, 2002
 - Symposium – **Material Emissions/Adsorption and IAQ** organized by Gemma Kerr
 - Symposium – **Practical Applications of Multizone Modeling** organized by Stuart Dols
 - Symposium – **Airflow Around Human Bodies** organized by Jianshun Zhang
- VOTE 8-0-0-11 to approve the program plan described above

8. **Handbook** – Reported by Ray Horstman.

- New chapter is in by electronic vote (YEAH). Can be changed every year for CD – 4 years for printed version.

9. **Standards** – Dave Ensor

- 62.2 Vent and IAQ for Residential Buildings - Steve Emmerich
Completed 1st public review and voted out for 2nd pr
- 113
- 55 Thermal Comfort - Diotima von Kempster

10. **Web Site** – Reported by Stuart Dols

- Keywords
- List server – open it to public
- Put minutes in Word and PDF format
- Presentations in PDF format
- List of research reports and summaries

11. **Relevant Activities**

TC1.2 *Instruments and Measurements* - Arsen Melikov
TC2.1 *Physiology and Human Environment* - Diotima Von Kempster
TC2.3 *Gaseous Air Contaminants/Removal Equipment* - Gemma Kerr
TC2.4 *Particulate Air Contaminants/Removal Equipment* - Dave Ensor
TC5.3 *Room Air Distribution* - John Jenssen
TC5.8 *Industrial Ventilation* - Duncan Phillips
TC9.3 *Transportation* - Ray Horstman

New Business

- Short course development – send proposals to Ann Spengler spengler@ashrae.org

12. A move to **adjourn** was made and approved.